USDA United States Department of Agriculture | Forest Service | Northeastern Area State and Private Forestry | 180 Canfield Street Morgantown, WV 26505-3101

File Code: 3400
Date: November 30, 2006

Mr. Tom Gentile
Earle Naval Weapons Station
Environmental Department
Building C-23
Colts Neck, NJ 07722

Dear Tom:

On November 14 and 15, 2006, USDA Forest Service personnel conducted a gypsy moth egg mass survey at Earle Naval Weapons Station. The purpose of this survey was to determine gypsy moth population densities and to assess the potential for defoliation in 2007.

Gypsy moth survey plots were randomly selected based upon available host trees (oak species), size of sample area and uniformity between egg mass counts. At each sample point, a 1/40th acre fixed radius plot was established. The plots consisted of a tally of all the new (2006) egg masses observed on the overstory trees, understory vegetation, ground litter and duff. The total number of egg masses observed for each plot was multiplied by 40 to determine the number of egg masses per acre. Egg mass lengths were also measured at the plots to determine the overall "health" of the existing population and as a measure of egg mass fecundity.

The location of the survey plots are shown in Figure 1. The summarized results of the survey are presented in Table 1. In brief, egg mass densities at Earle Naval Weapons Station ranged from 0-13,680 and averaged 1,783 egg masses per acre. Overall egg mass lengths tended to be moderate to large in size, ranging from 14-46 mm and averaging 28 mm. Egg masses larger than 25 mm typically indicate healthy populations. The highest concentrations of gypsy moth are located in the central portion of Earle Naval Weapons Station.

Gypsy moth population levels along with their health varied greatly. For the most part, areas that were defoliated during the summer of 2006 have few egg masses and/or small egg masses. Enclosed for your information is the figure from the defoliation report dated 7/5/06 (Figure 2). Gypsy moth populations in the large defoliated area on the west side of Earle NWS have collapsed. Egg mass densities in this area averaged over 16,000 egg masses per acre in 2005 and now average only 170 egg masses per acre.

The survey results indicate that gypsy moth populations are still sufficient to cause heavy defoliation (61-100 percent) in several areas of Earle Naval Weapons Station in 2007 (Figure 3).

This defoliation prediction is further supported when egg density is also used as a means of

estimating gypsy moth population densities. Moore and Jones (1987) found that estimating the mean fecundity would increase the precision of gypsy moth density estimates and that a linear relationship exists between egg mass length and fecundity. Further work by Liebhold et al., (1993) demonstrates that the product of the mean egg mass length (mm) and egg mass density provides a more precise means of estimating population densities and predicting defoliation. Using Liebhold's model, Figure 4 shows how this information can be used to correlate the predicted defoliation of an area. Accordingly, the estimated egg mass density of 6,140 masses per acre (average egg mass density in the area around the administration buildings) x 31 mm (average egg mass length) translates to a projected defoliation level of about 85 percent (heavy defoliation). Because egg mass densities and host type are not evenly distributed, actual defoliation will vary from tree to tree but will be predominately heavy throughout this area. Heavy defoliation is also predicted for the other three areas shown in Figure 3. Very little, if any, defoliation is likely elsewhere at Earle Naval Weapons Station in 2007.

Please call me at 304-285-1555 if you have any questions regarding this egg mass survey or this letter.

Sincerely,

Rodney L. Whiteman

RODNEY L WHITEMAN
Forester
Forest Health Protection

Enclosures

Cc: Joe Zoltowski, NJDA
George Koeck, NJDF
Noel Schneeberger, AO

RLW/blm

REFERENCES

Liebhold, A.M., Simons, E.E., Sior, A., and Unger, J.D., 1993. Forecasting defoliation caused by the gypsy moth from field measurements. Environ.Entomol. 22(1): 26-32.

Moore, K.E.B. and Jones, C.G. 1987. Field estimation of fecundity of gypsy moth (Lepidoptera Lymnatriidae). Environ. Entomol. 16: 165-167

Table 1 – Results of the gypsy moth egg mass survey conducted at Earle Naval Weapons Station, November 14 and 15,

Plot number	Number em/acre	em size (mm)	Plot number	Number em/acre	em size (mm)
1	200	34,24,22	24	0	—
2	7160	34,24,22	25	0	—
3	0	28,24,24	26	0	—
4	0	—	27	0	—
5	0	—	28	0	—
6	40	—	29	280	36,32
7	40	—	30	0	—
8	40	—	31	480	14
9	160	—	32	120	14,16
10	13400	28,24,24	33	0	—
11	2120	20,34,24	34	80	14
12	280	40,34,32	35	7120	26,34,28
13	5200	36,16,24	36	320	26,40
14	13680	34,16,22	37	440	16,14
15	120	—	38	5880	34,38,24
16	80	—	39	9400	36,32,30
17	8720	44,34,38	40	960	46,36,32
18	0	—	41	0	—
19	40	—	42	80	—
20	0	—	43	80	—
21	200	32	44	4560	34,26,30
22	7600	28	45	0	—
23	0	—	46	0	—

em/acre range = 0 -13680 em size range (mm) = 14-46
em/acre average = 1783 em size average (mm) = 28

Figure 1. -- Gypsy moth egg mass survey plot locations at Earle Naval Weapons Station, November 13 and 14, 2006.

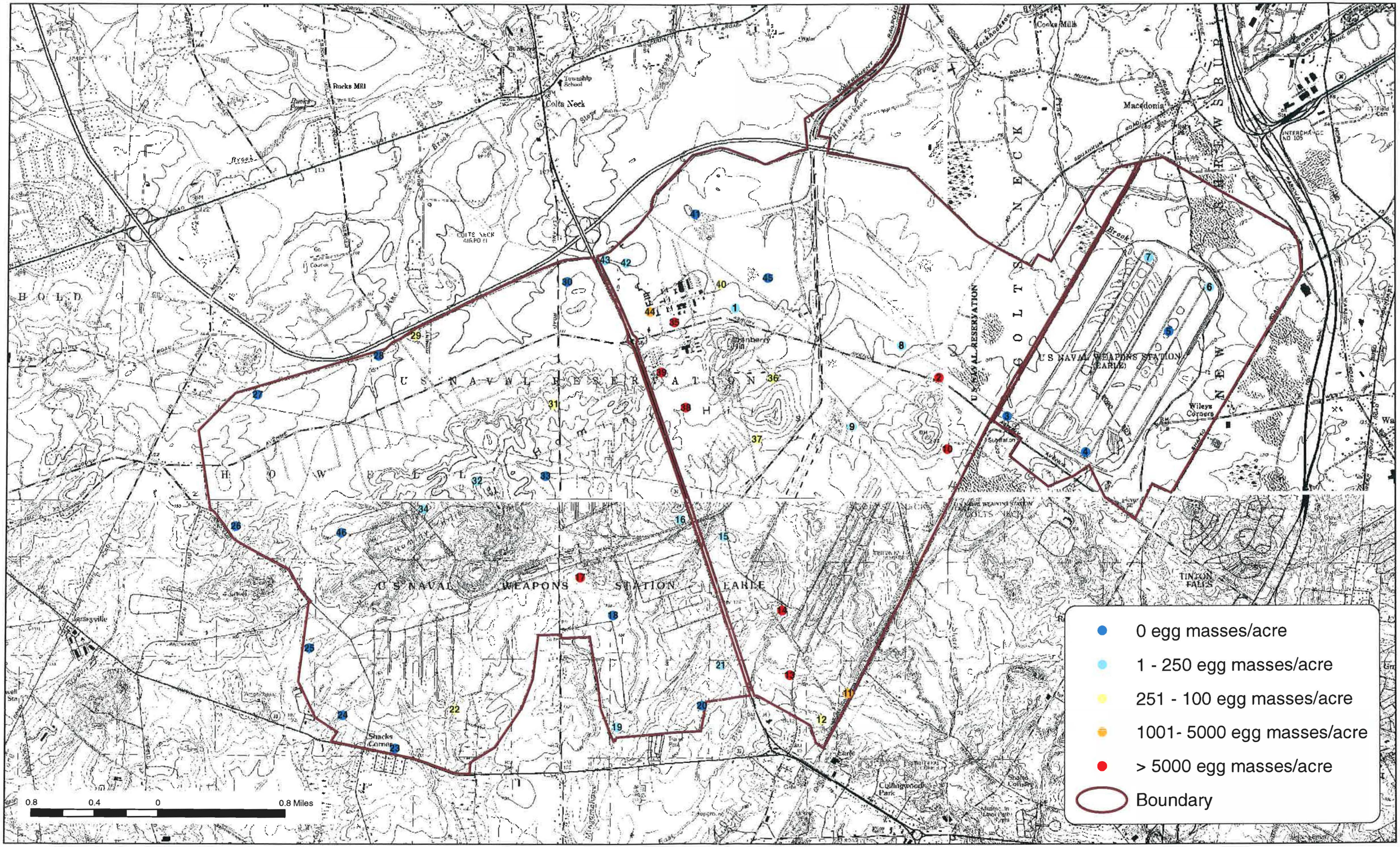


Figure 2. -- Results of the aerial dection survey conducted at Earle Naval Weapons Station on June 14, 2006.

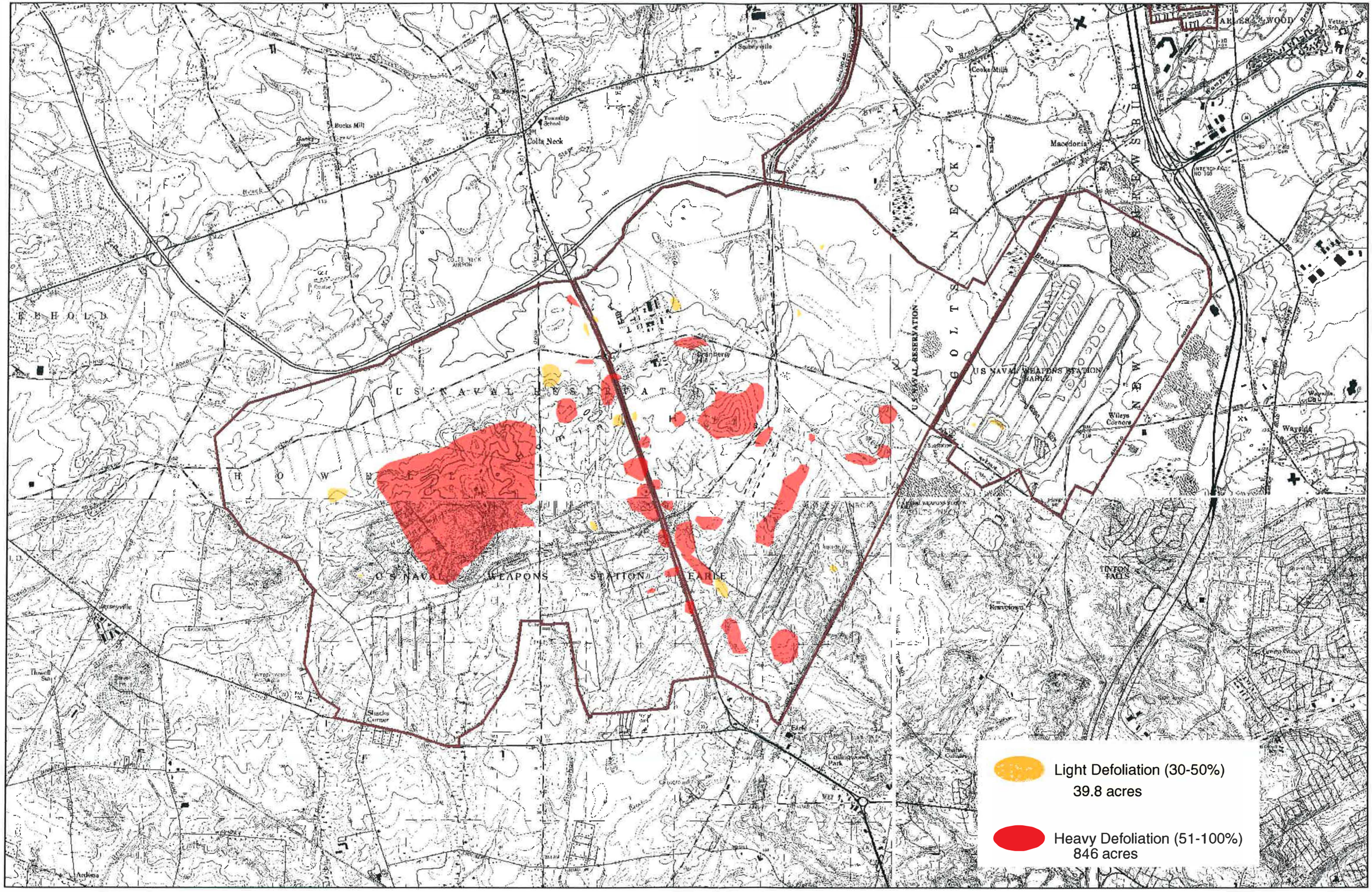


Figure 3. -- Areas where defoliation is likely at Earle Naval Weapons Station in 2007.

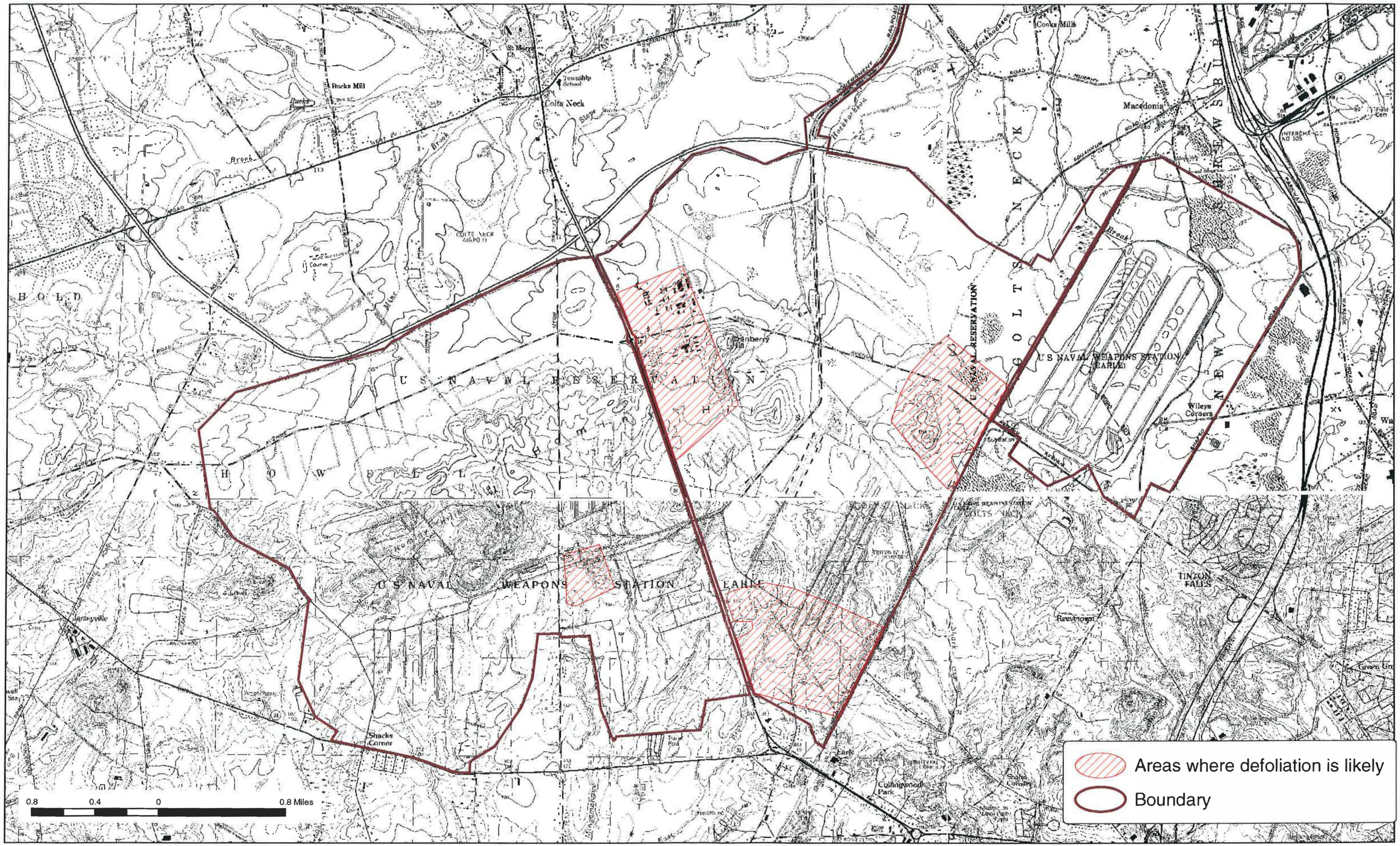
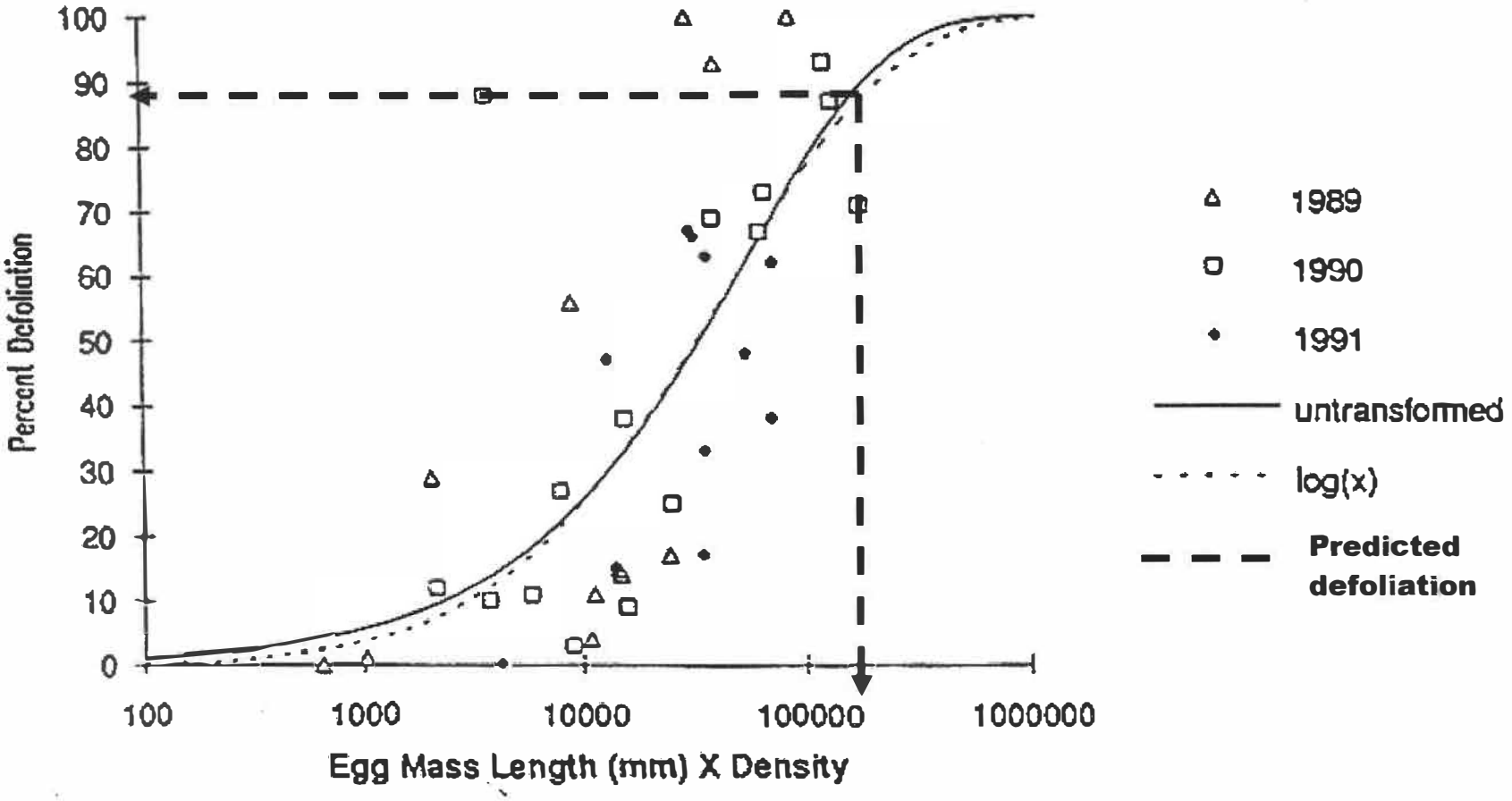


Figure 4.—Predicted defoliation in area around administration buildings at Earle Naval weapons Station in 2007.



Scatter plot of the product of mean egg mass length and egg mass density versus mean defoliation. Extracted from Liebhold et al. (1993).